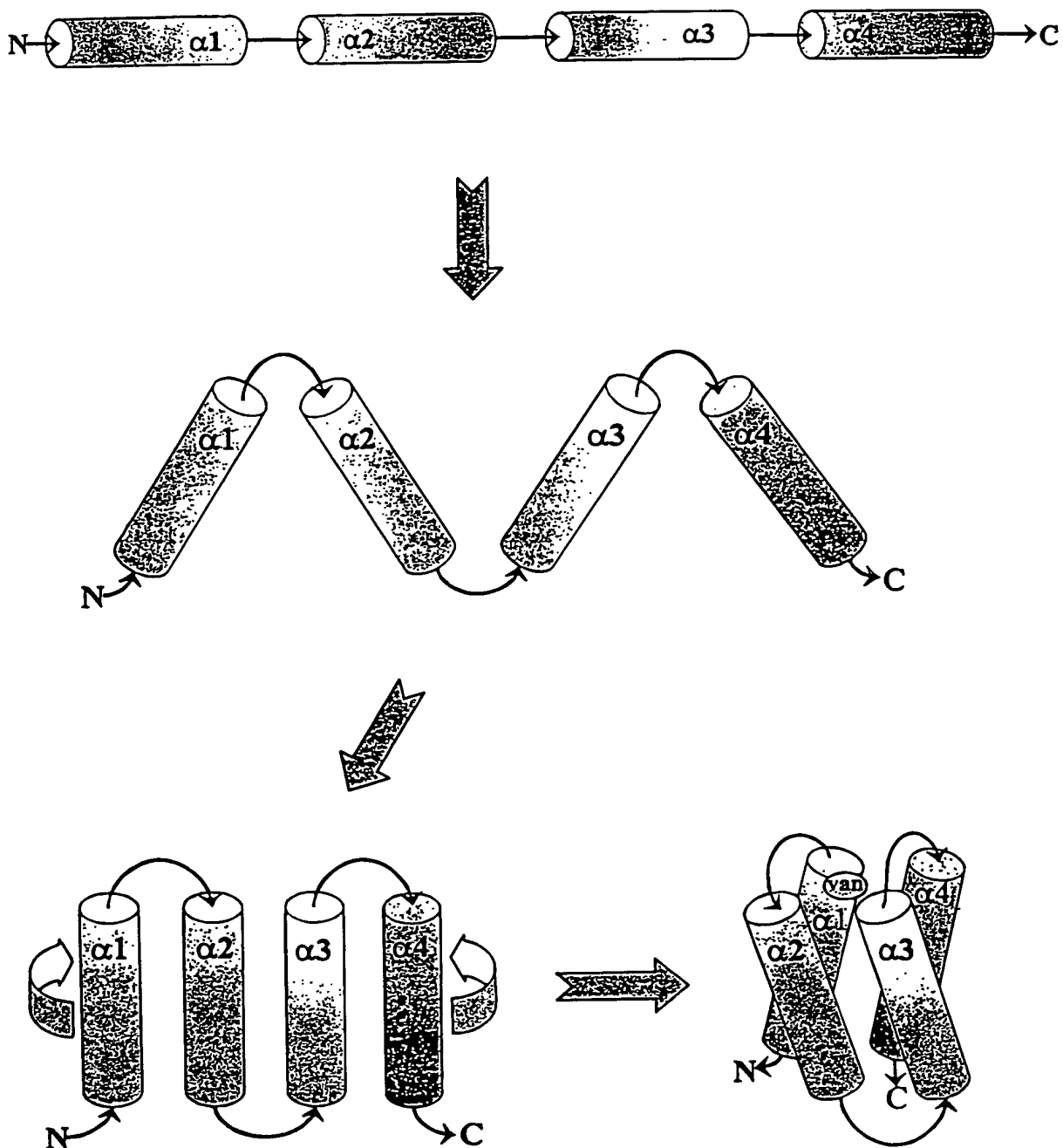


Figure 1



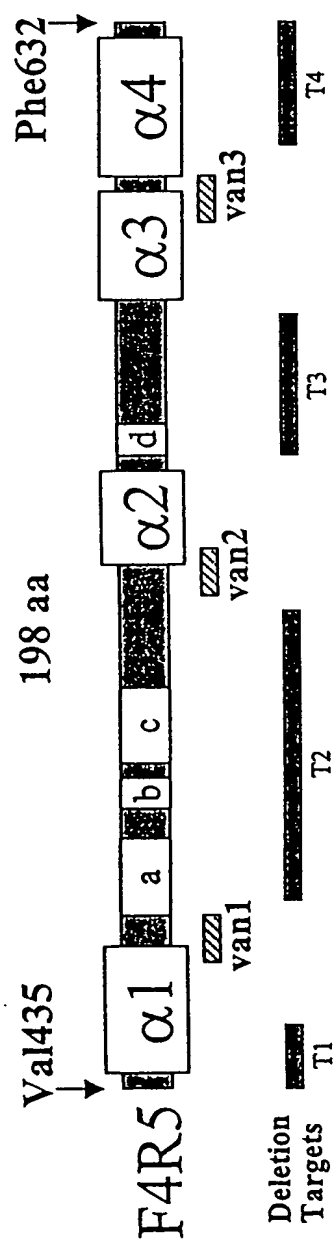


FIG. 2

Figure 3

Recombinant *Fucus* Vanadium Peroxidase Proteins

		# of Amino acids	kDa	VPx activity
rVPx1	M1 [redacted] A676	676	73.4	+
rVPx2	A137 [redacted] A676	540	58.6	+
rVPx3	L313 [redacted] A676	364	40.0	+
F1	E343 [redacted] A676	334	36.8	+
F2	G373 [redacted] A676	304	33.4	+
F3	Y404 [redacted] A676	273	29.8	+
F4	V435 [redacted] A676	242	26.5	+
R5	L313 [redacted] F632	320	35.5	+
R6	L313 [redacted] Q652	340	37.6	+
F1R6	E343 [redacted] Q652	310	34.4	+
F2R6	G373 [redacted] Q652	280	31.0	+
F4R5	V435 [redacted] F632	198	21.7	+

Amino Acid Site in rVPx1 <i>Fucus</i> Enzyme	Potential Amino Acid Role in vanadate-binding motifs 1-3	Amino acid at Corresponding <i>Ascophyllum</i> Site
Lys460	Vanadium Binding - 1 st	Lys341
Arg468	Vanadium Binding - 1 st	Arg349
Ser535	Vanadium Binding- 2 nd	Ser416
Gly536	Vanadium Binding- 2 nd	Gly417
His537	Vanadium Binding- 2 nd	His418
Arg599	Vanadium Binding – 3 rd	Arg480
His605	Vanadium Binding – 3 rd	His486
His464	In BrPx Only - 1 st	His345
His530	In BrPx Only - 2 nd	His411
Ala455	Activity -1 st	Ser336
Cys457	Activity - 1 st	Trp338
Val525	Activity - 2 nd	Glu406

FIG. 4

1st Conserved Motif:

AQRASCYQKWQVHRFARPEALG	Fucus
AxxxxxYQKxxxHRxxRPEAxG	Algal
AxxxxxxxxKxxx (x) xxxRPxx (x) G	Algal and Fungal
Kxxx (x) xxxRP	Algal, Fungal, Phosphatases & Other Proteins

(x) = amino acid present in algal enzymes only

2nd Conserved Motif:

PTHPSYPSGHATQNGAFAT	Fucus
PxHPSYxSGHAXxxGA	Algal
PxxPxYxSGHAXxxGA	Algal and Fungal
(SY)PSGH	Algal, Fungal, Phosphatases & Other Proteins

(SY) = conserved in some of the proteins

3rd Conserved Motif:

NKLAVNVAFGRLGIHYRFD	Fucus
NKLAXNXAXGRxMxGxHYxxD	Algal
AxxRxxxGxHxxxD	Algal and Fungal
Rxx (G) xHxxx (D)	Algal, Fungal, Phosphatases & Other Proteins